



MANILA OBSERVATORY

The Importance of Measuring Air Quality

Insights from 25 Years of Air Quality Dynamics Research

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HEAD, AIR QUALITY DYNAMICS LABORATORY

Manila Observatory



- Established in 1865
- Served as the Philippine Weather Bureau until 1945 and eventually the Seismology Bureau until 1945
- After World War II, pivoted to atmospheric, seismological, and solar research

Manila Observatory



- In the mid-80s, began its shift into environmental, climate, and air quality science
- Present laboratories:
 - Air Quality Dynamics
 - Regional Climate Systems
 - Data and Sensor Development
 - Geomatics for Environment and Development
 - GeoDynamics Research

Air Quality Dynamics Laboratory

Provide scientific guidance to air quality assessment and mitigation policy development.

Monitoring and modeling activities that form the scientific basis of effective air quality management.



Air Quality Dynamics Team



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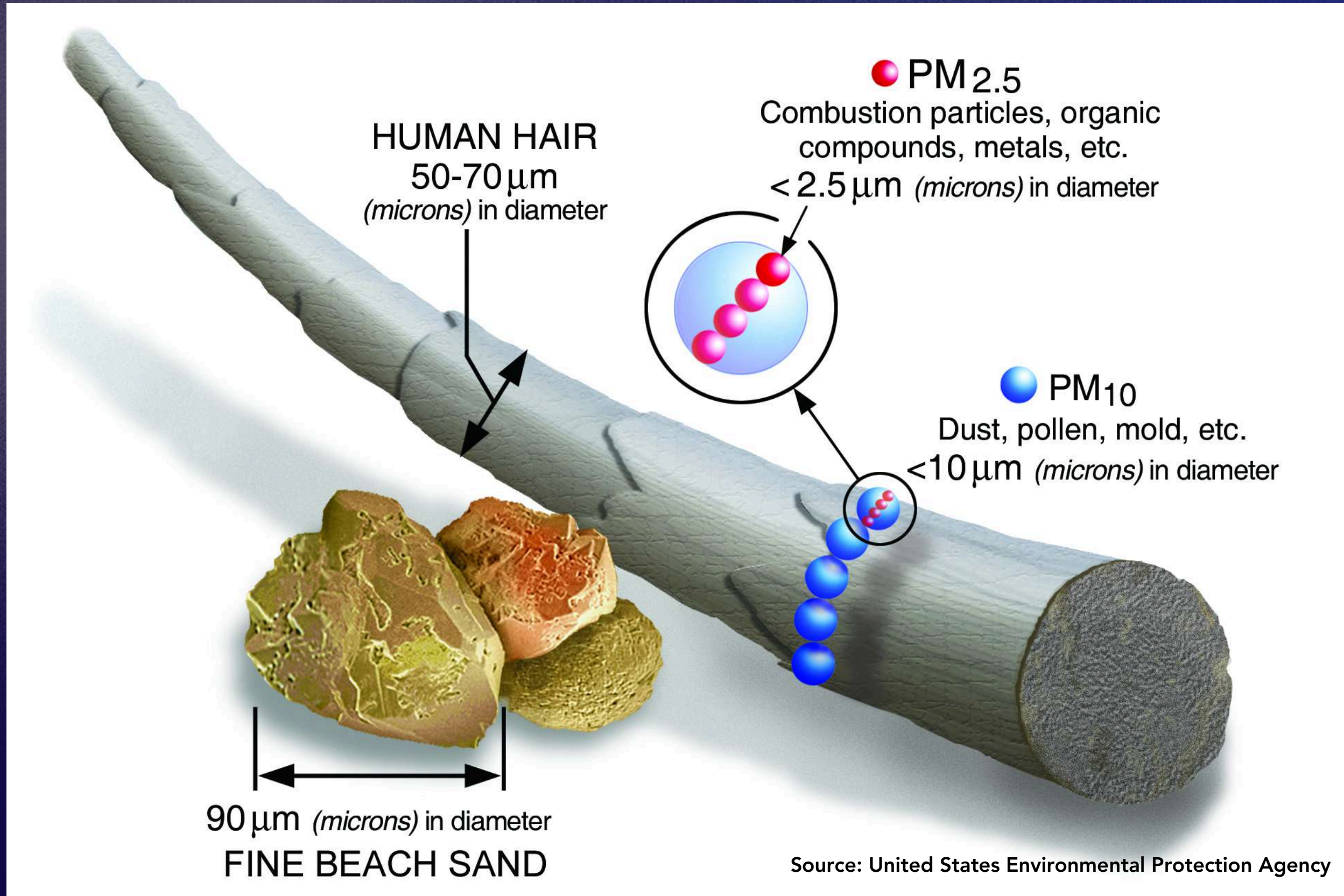
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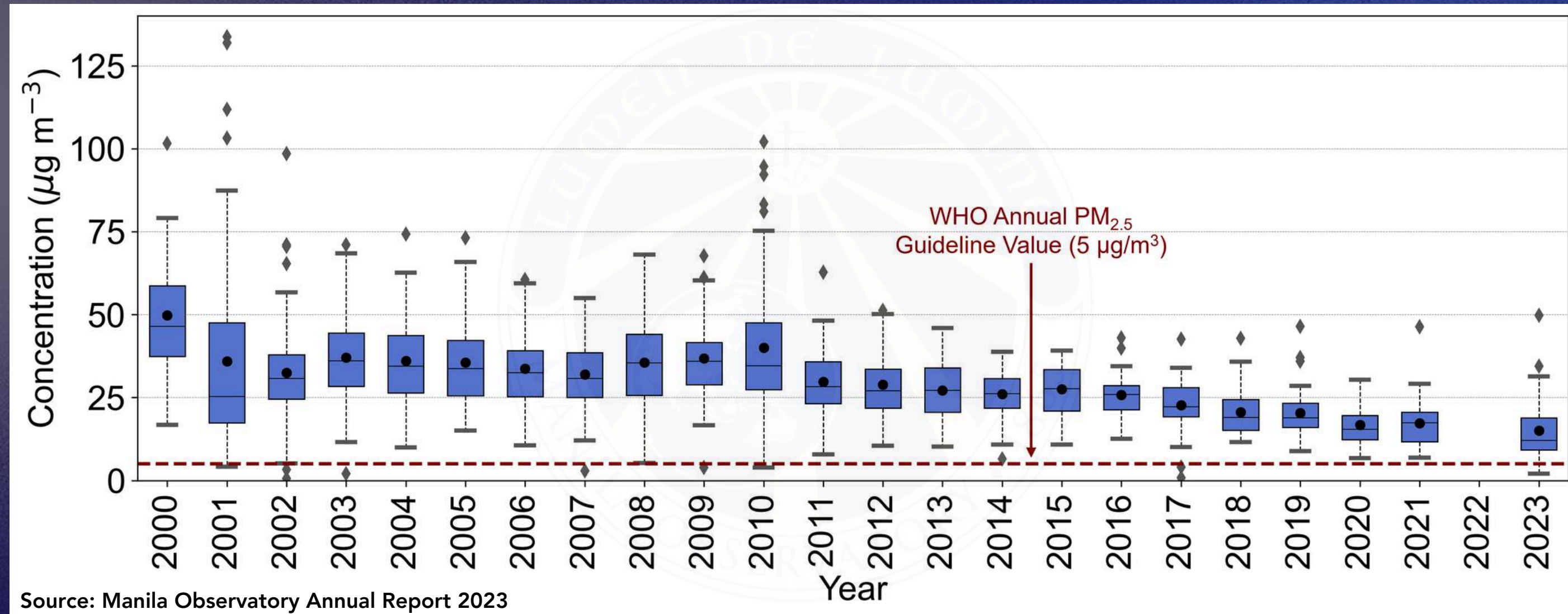
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Particulate Matter

is a mixture of microscopic **solid particles** and **liquid droplets** suspended in the air, including dust, soot, smoke, and chemicals.

Air quality impacts are demonstrated by long-term measurements.

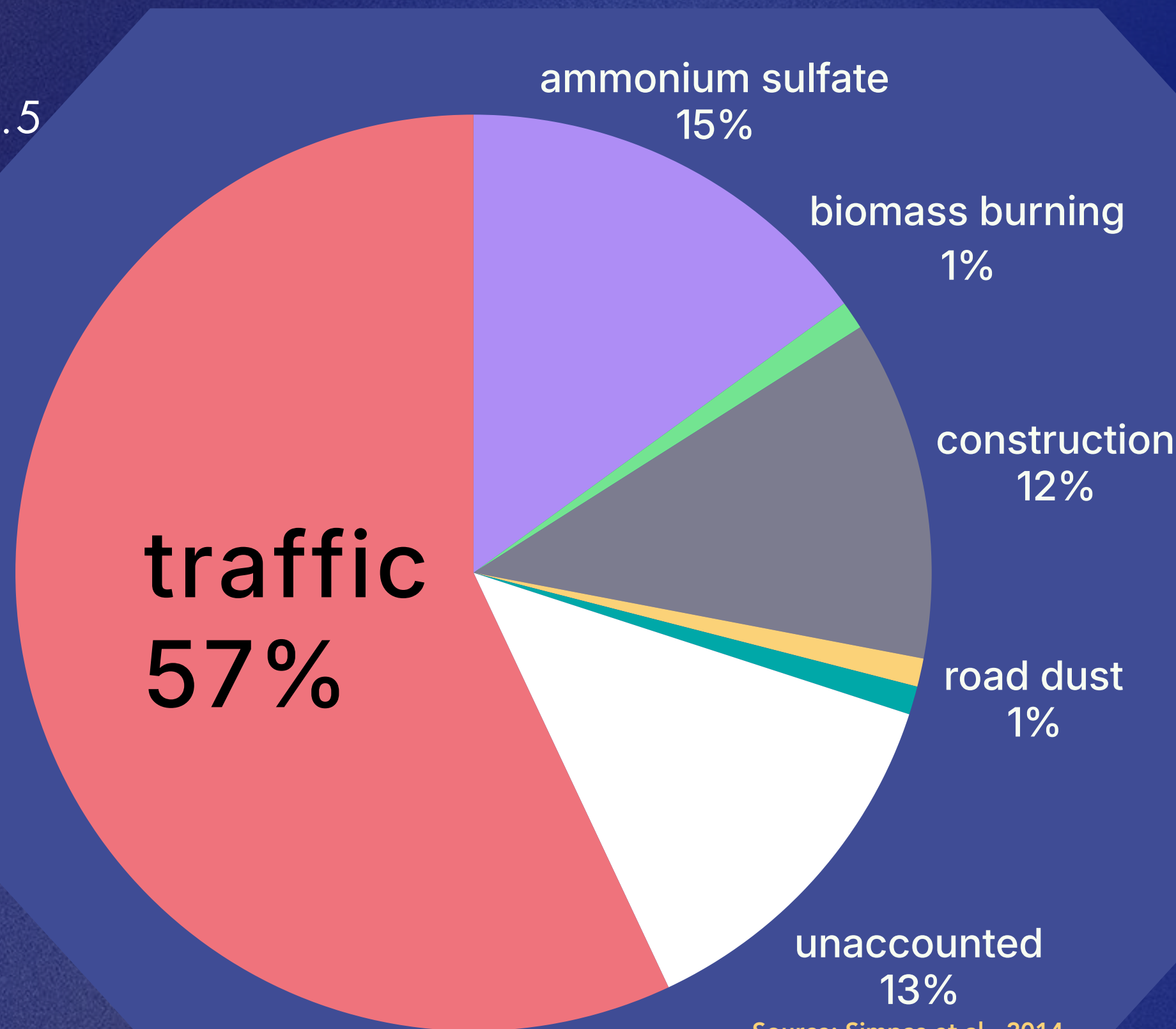


From 20+ years of data collected at the Manila Observatory, we observe a **decreasing trend** in fine-particle pollution (PM_{2.5}) levels.

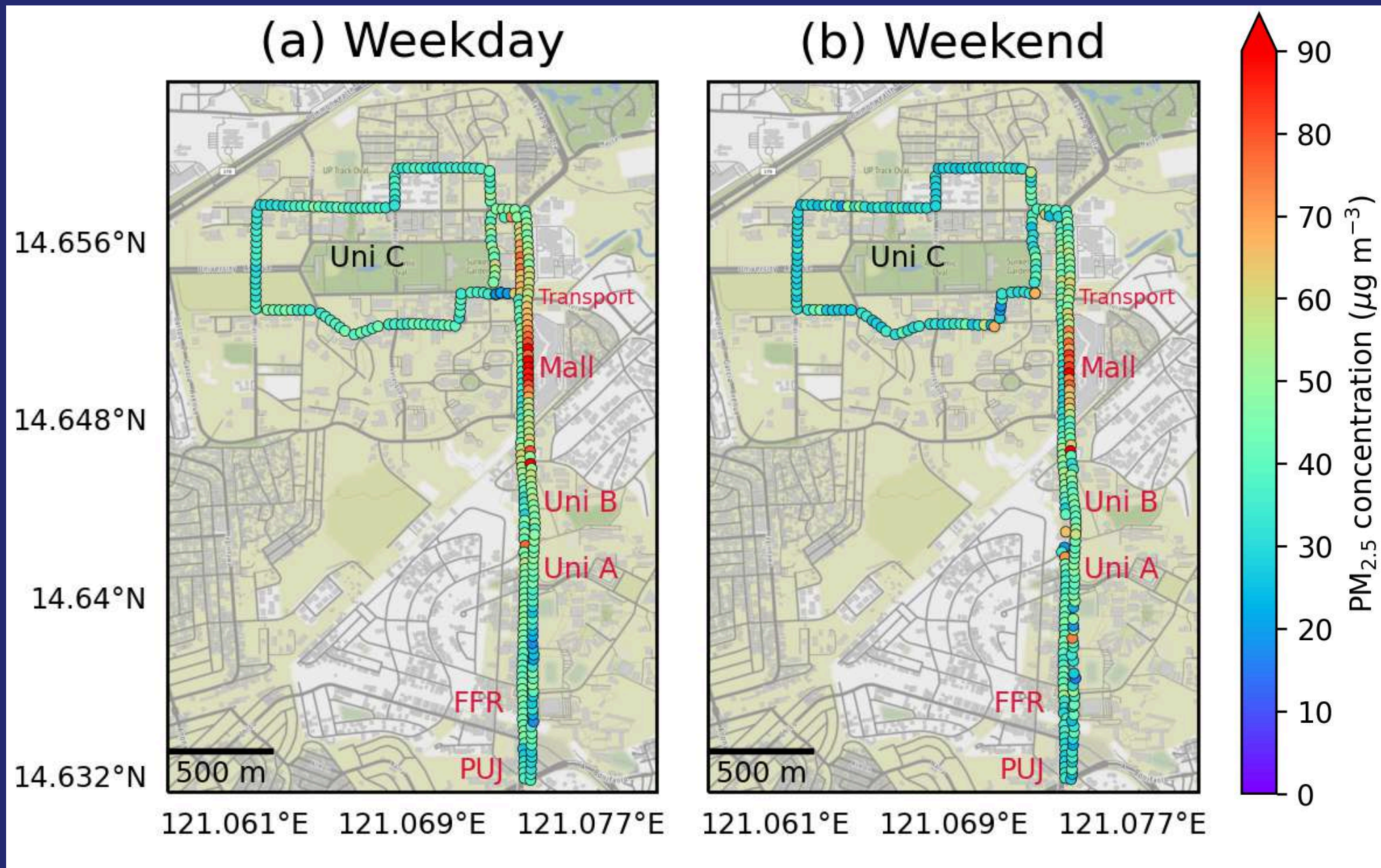
However, current levels still exceed the World Health Organization's (WHO) annual guideline value of 5 µg/m³.

Where does PM_{2.5} come from?

The traffic source contributes the most to the observed PM_{2.5} levels.



Source: Simpas et al., 2014



Pollution hotspots are revealed by denser monitoring networks.

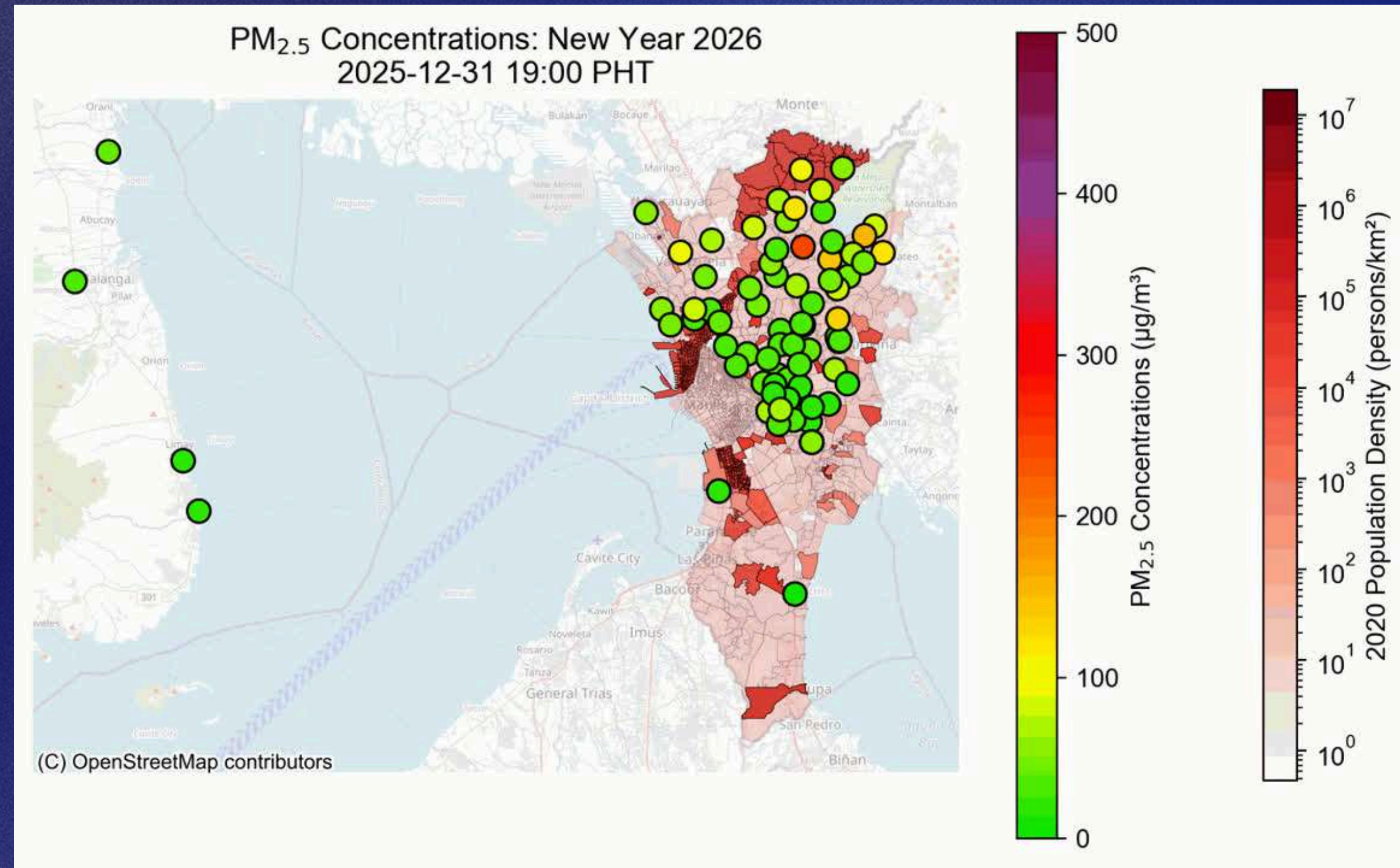
Source: Collado et al., 2022

The jeepney drivers' mean personal exposure is $36.4 \mu\text{g}/\text{m}^3$. This value is **seven times greater** than the mean annual guideline value ($5 \mu\text{g}/\text{m}^3$) set by the World Health Organization (WHO).



Firework-Related Air Pollution

The Clarity sensors in Metro Manila recorded a massive spike in $PM_{2.5}$ levels, triggered the moment the fireworks began.



Main Takeaways

- Air quality impacts are demonstrated by long-term measurements.
- Pollution hotspots are revealed by denser monitoring networks.
- Accessibility of data is key.

